new jersey department of environmental protection

INDUSTRIAL POLLUTION PREVENTION IN NEW JERSEY:

A Trends Analysis of Materials Accounting Data From 1994 to 2001

and

An Annual Report for 2001

Winter 2003

New Jersey Department of Environmental Protection
Bradley M. Campbell, Commissioner

Purpose and Scope of the Report

- provide public information on the use, generation, and release of hazardous substances in New Jersey
- data evaluated in the report is submitted by facilities under the Worker and Community Right to Know Act (W&CRTK) and P2 Act
- includes a detailed evaluation and data release for calendar year 2001

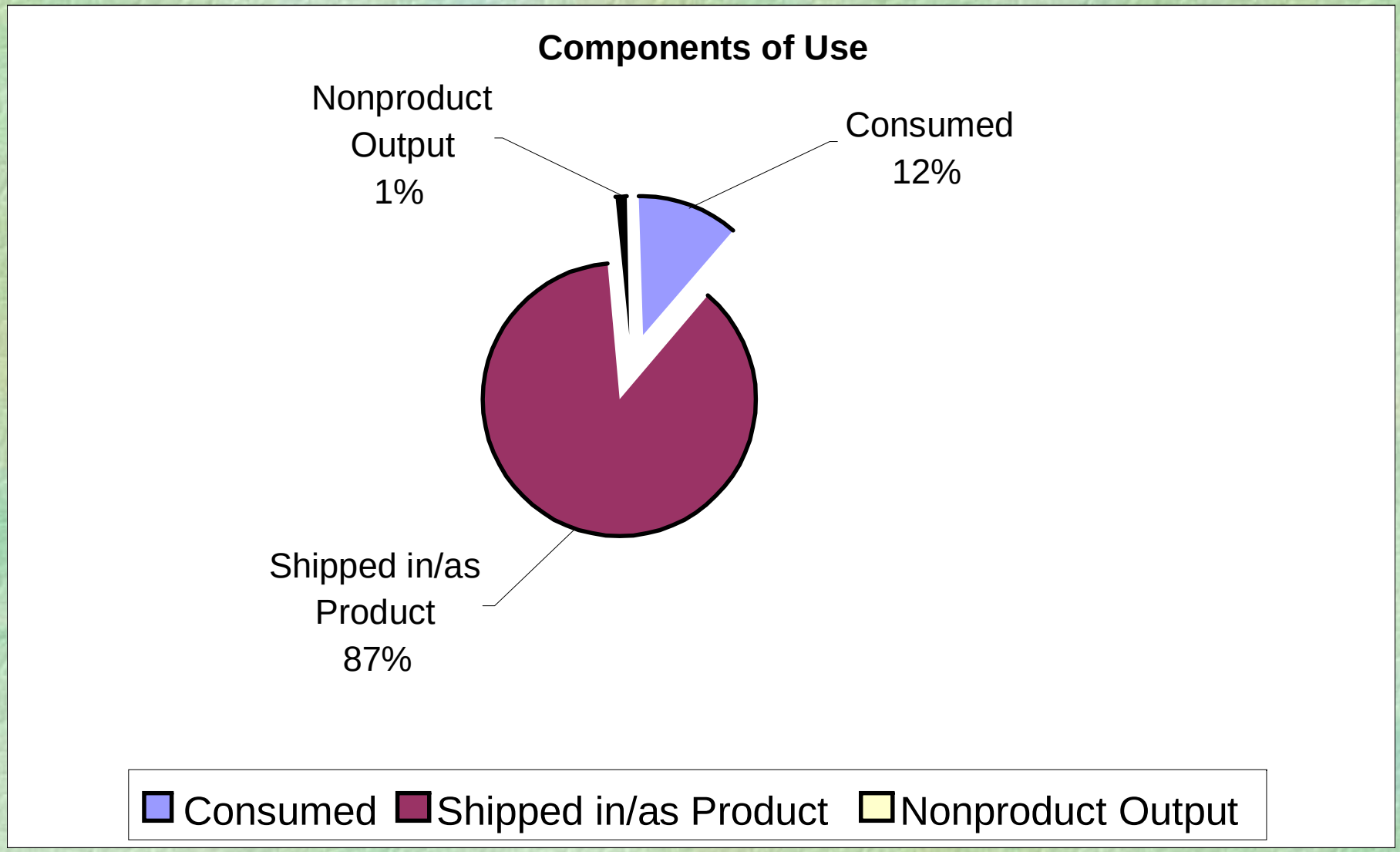
How Does NJDEP Use This Data?

- To identify priorities
  - individual facilities over time
  - individual manufacturing sectors or SIC codes
  - geographic pattern at county or municipal level

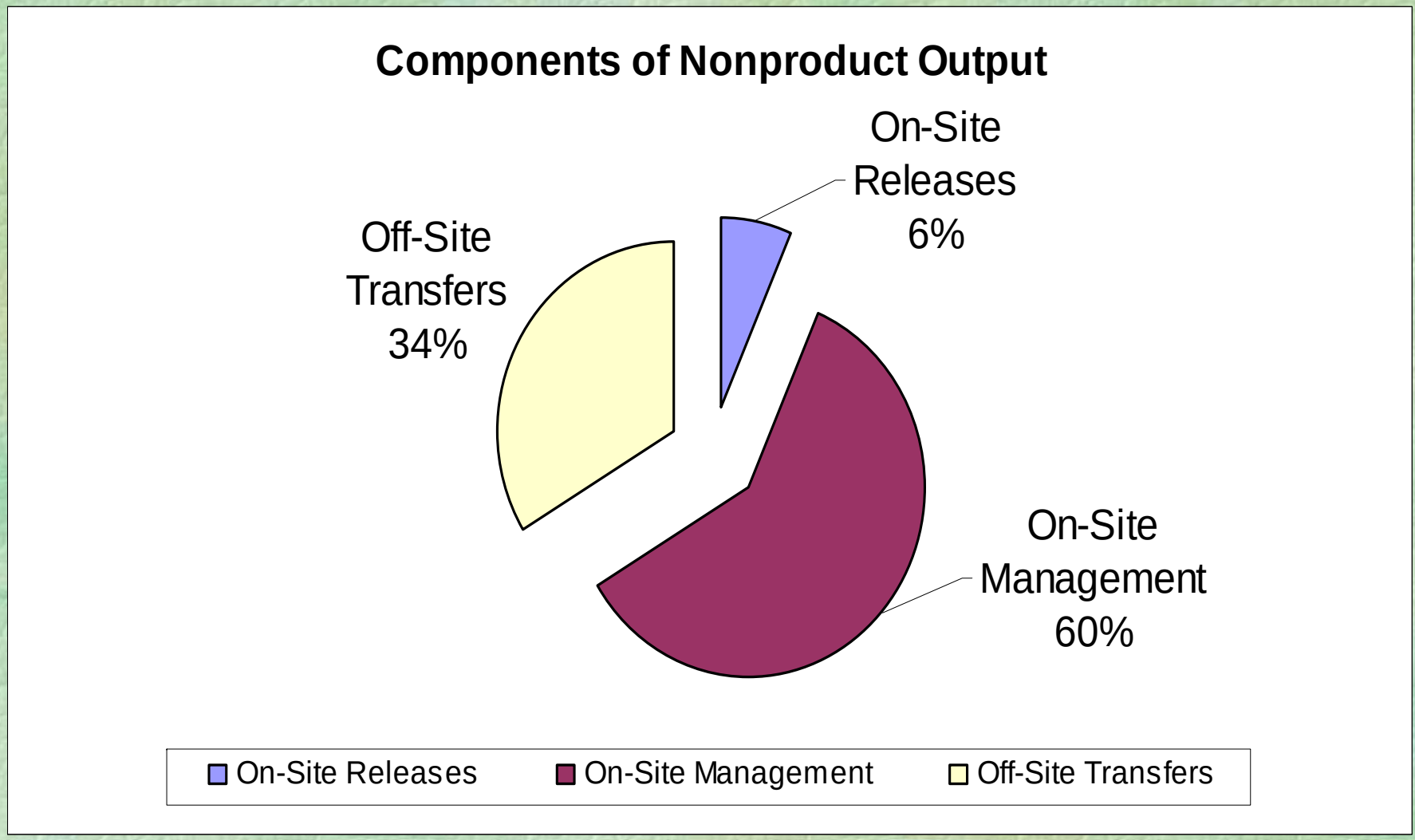
Summary of Methods

- Data are reported by facilities on a form known as the Release and Pollution Prevention Report: Section B
- Report tracks components of Use and NPO from 1994-2001

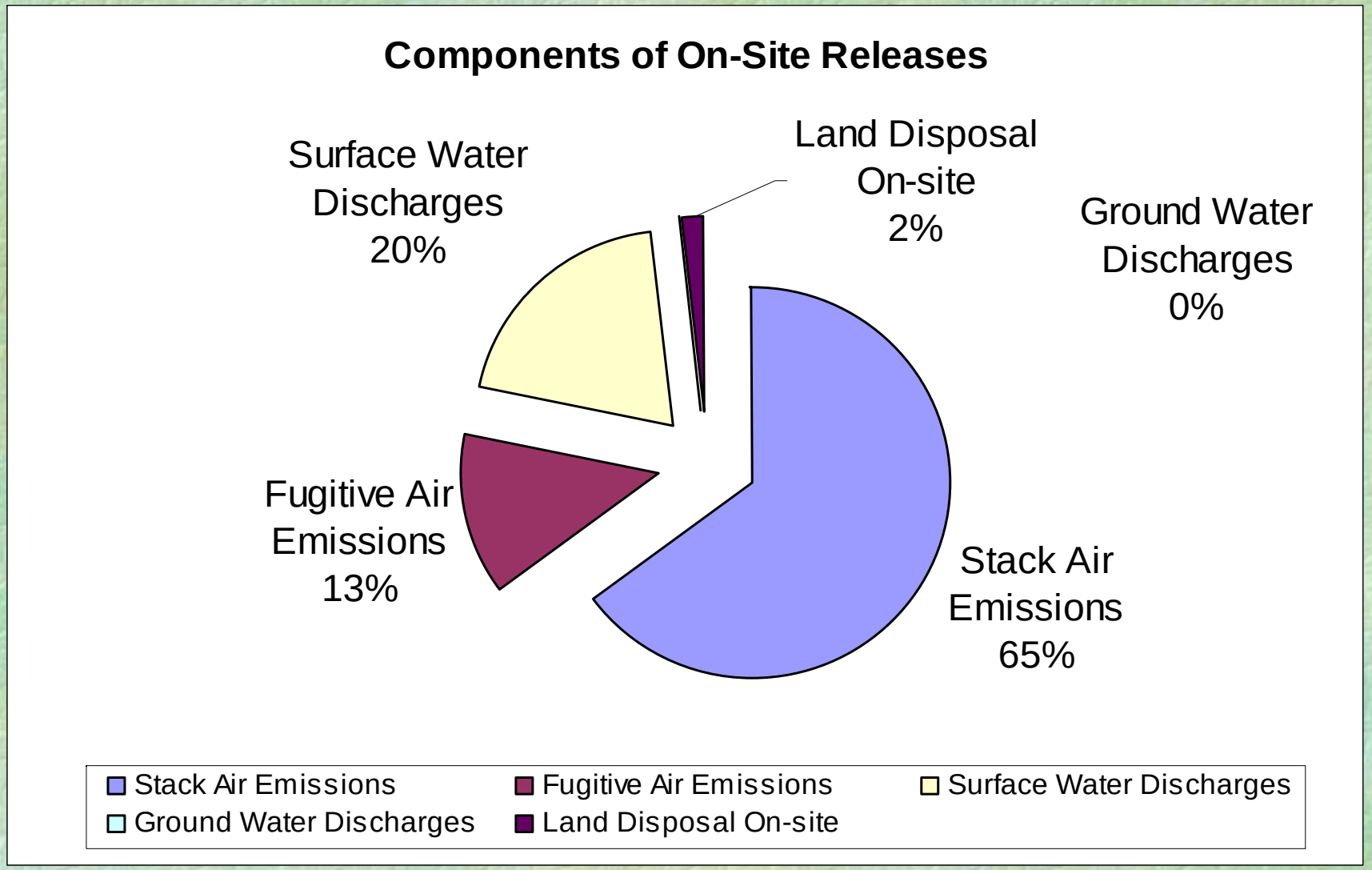
Components of Use RY 2001



Components of NPO RY 2001



Components of On-site Releases RY 2001



Summary of Methods (cont)

- **Meaninful Metrics:**
- **Unadjusted v. Adjusted**

- **Unadjusted**: concerned with exposure and potential risks
- **Adjusted**: useful for assessing if changes are due to production changes or attributed to process efficiency (a.k.a. pollution prevention)

Universes

- All Universe- all facilities and chemicals
- Core Universe-core chemicals, core SIC codes, excludes trade secrets
- Core Universe minus SIC code 2911
- Matched facility and chemical
- Specific Groups- Carcinogens, PBTs, EHS

Reporting facilities in Universes

Year	All Facilities	Core Universe	Core Minus Refineries*	Matched Facility/Chemicals
1994	652	585	576	145
1995	558	510	501	145
1996	550	505	497	145
1997	487	450	442	145
1998	534	447	439	145
1999	485	404	396	145
2000	506	401	393	145
2001	522	420	413	145

Overview of Findings #1

- Overall, New Jersey facilities have achieved substantial reductions statewide for NPO and releases of hazardous substances.
  - Even though production increased 10%, NPO decreased 26% and releases decreased by 58%
  - When quantities are adjusted for production, NPO decreased 33% and releases decreased 62%.

Summary of NPO Trends

Table ES2. Summary of Statewide NPO Trends

	Nonproduct Output		On-site Releases		Off-Site Transfers		Managed On-Site	
Year	NPO (Adjusted)	NPO	On-site Releases (Adjusted)	On-site Releases	Off-Site Transfers (Adjusted)	Off-Site Transfers	Managed On-Site (Adjusted)	Managed On-Site
1994	217,888,932	217,888,932	13,659,206	13,659,206	106,055,181	106,055,181	98,174,545	98,174,545
1995	234,629,257	246,829,978	11,235,382	11,819,622	101,416,374	106,690,025	121,977,501	128,320,331
1996	204,113,465	229,328,826	9,049,432	10,167,363	94,635,652	106,326,562	100,428,381	112,834,901
1997	198,860,752	224,544,350	9,651,815	10,898,382	87,568,937	98,878,788	101,640,000	114,767,180
1998	170,570,751	208,008,639	7,099,577	8,657,834	77,237,168	94,189,643	86,234,007	105,161,162
1999	163,793,596	196,548,089	6,713,684	8,056,247	75,767,613	90,919,181	81,312,299	97,572,661
2000	175,981,389	201,036,816	5,923,341	6,766,679	85,306,036	97,451,520	84,752,011	96,818,616
2001	146,205,649	160,340,872	5,193,272	5,695,360	76,275,429	83,649,769	64,736,948	70,995,743
Total Change	-71,683,283	-57,548,060	-8,465,934	-7,963,846	-29,779,752	-22,405,412	-33,437,597	-27,178,802
Percent Change	33% reduction	26% reduction	62% reduction	58% reduction	28% reduction	21% reduction	34% reduction	28% reduction

Overview of Findings #2

- Overall, New Jersey facilities have made less progress reducing the Use of hazardous substances compared to NPO and releases.
  - Facilities have increased the Use of hazardous substances by 8% (unadjusted); when adjusted for production, Use decreased by 2%.
  - Facilities are using hazardous substances more efficiently, but increases in production are outpacing the efficiency improvements to drive Use up.
  - Increases in Use of hazardous substances are caused by increases in chemicals shipped as/in product

SUMMARY OF USE TRENDS

Table ES1. Summary of Statewide Use Trends

	USE		Nonproduct Output		Shipped as (or in) Product		Consumed		Weighted Production Index	
Year	Use (Adjusted)	Use	NPO (Adjusted)	NPO	Shipped (Adjusted)	Shipped	Consumed (Adjusted)	Consumed	Yearly	Cum
1994	13,824,248,003	13,824,248,003	217,888,932	217,888,932	10,797,827,924	10,797,827,924	2,808,531,147	2,808,531,147	1.00	1.00
1995	13,912,432,280	14,635,878,759	234,629,257	246,829,978	10,950,895,804	11,520,342,386	2,726,907,220	2,868,706,395	1.05	1.05
1996	13,583,697,063	15,261,772,663	204,113,465	229,328,826	10,858,465,089	12,199,876,432	2,521,118,509	2,832,567,405	1.07	1.12
1997	13,929,267,302	15,728,283,434	198,860,752	224,544,350	11,152,069,754	12,592,400,602	2,578,336,796	2,911,338,482	1.01	1.13
1998	14,751,666,831	17,989,450,799	170,570,751	208,008,639	12,226,122,998	14,909,585,517	2,354,973,082	2,871,856,643	1.08	1.22
1999	12,994,103,799	15,592,589,296	163,793,596	196,548,089	10,784,721,167	12,941,387,142	2,045,589,037	2,454,654,066	0.98	1.20
2000	13,957,313,926	15,944,492,599	175,981,389	201,036,816	11,575,371,315	13,223,419,868	2,205,961,222	2,520,035,916	0.95	1.14
2001	13,597,144,743	14,911,722,405	146,205,649	160,340,872	11,277,406,658	12,367,711,068	2,173,532,438	2,383,670,466	0.96	1.10
Total Change	-227,103,260	1,087,474,402	-71,683,283	-57,548,060	479,578,734	1,569,883,144	-634,998,709	-424,860,681	**10% increase**	
Percent Change	- 2%	+ 8%	- 33%	- 26%	+ 4%	+ 15%	- 23%	- 15%		
	reduction	increase	reduction	reduction	increase	increase	reduction	reduction		

Comparison of Core Group v. Core Group minus SIC code 2911 (refineries)

	USE		Nonproduct Output		Shipped in/as Product		Consumed		Weighted Production Index
	Use (Adjusted)	Use	NPO (Adjusted)	NPO	Shipped (Adjusted)	Shipped	Consumed (Adjusted)	Consumed	Cum
Core Group									
Total Change	-227,103,260	1,087,474,402	-71,683,283	-57,548,060	479,578,734	1,569,883,144	-634,998,709	-424,860,681	10% increase
Percent	2%	8%	33%	26%	4%	15%	23%	15%	
Change	reduction	increase	reduction	reduction	increase	increase	reduction	reduction	
Core minus 2911									
Total Change	-950,923,193	-511,673,327	-78,757,702	-56,715,958	-143,274,069	24,783,457	-728,891,421	-479,740,825	17% increase
Percent	27%	15%	38%	27%	13%	2%	33%	22%	
Change	reduction	reduction	reduction	reduction	reduction	increase	reduction	reduction	

Overview of Findings #3

- Statewide trends for Use are often driven by changes at a few large facilities
- Increases in Use by the top 10 facilities mask decreases in Use achieved by all other facilities combined
- Reductions in releases are more often attributed to the combined actions of several smaller facilities.

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Table 27. Top 10 Substances Used in 2001

CAS Number	Substance Name	Calculated Use	% of Total
1634-04-4	METHYL TERT-BUTYL ETHER	5,308,753,819	19.65 %
1330-20-7	XYLENE (MIXED ISOMERS)	4,625,014,527	17.12 %
108-88-3	TOLUENE	4,163,478,827	15.41 %
110-54-3	N-HEXANE	2,037,529,026	7.54 %
95-63-6	1,2,4-TRIMETHYLBENZENE	1,296,941,270	4.80 %
100-41-4	ETHYLBENZENE	1,251,039,975	4.63 %
71-43-2	BENZENE	1,127,816,785	4.17 %
115-07-1	PROPYLENE [PROPENE]	1,047,040,375	3.88 %
91-20-3	NAPHTHALENE	878,949,973	3.25 %
110-82-7	CYCLOHEXANE	657,653,704	2.43 %
	Sum of Top Ten:	**22,394,218,281**	**82.89 %**
	Sum Other:	**4,622,831,851**	**17.11 %**
	Sum All:	**27,017,050,131**	**100.00 %**

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Table 28. Top 10 Hazardous Substances Generated as NPO in 2001

CAS Number	Substance Name	NPO	% of Total
7647-01-0	HYDROCHLORIC ACID	63,476,733	22.52 %
67-56-1	METHANOL	30,377,601	10.78 %
108-88-3	TOLUENE	24,276,309	8.61 %
7439-92-1 & N420	LEAD & COMPOUNDS	15,642,499	5.55 %
7664-41-7	AMMONIA	14,989,452	5.32 %
N511	NITRATE COMPOUNDS (WATER DISSOCIABLE)	12,321,459	4.37 %
7697-37-2	NITRIC ACID	12,320,908	4.37 %
1330-20-7	XYLENE (MIXED ISOMERS)	9,993,037	3.55 %
7440-66-6 & N982	ZINC & COMPOUNDS	9,682,791	3.44 %
7440-50-8 & N100	COPPER & COMPOUNDS (WITH EXCEPTIONS)	9,641,373	3.42 %
	Sum of Top 10:	**202,722,162**	**71.92 %**
	Sum Other:	**79,140,400**	**28.08 %**
	Sum All:	**281,862,562**	**100.00 %**

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Table 29. Top 10 Hazardous Substances Released in 2001

CAS Number	Substance Name	On-Site Releases	% of Total
7647-01-0	HYDROCHLORIC ACID	6,154,312	34.31 %
N511	NITRATE COMPOUNDS (WATER DISSOCIABLE)	3,099,303	17.28 %
7664-41-7	AMMONIA	1,330,004	7.41 %
108-88-3	TOLUENE	893,134	4.98 %
1330-20-7	XYLENE (MIXED ISOMERS)	666,530	3.72 %
7664-93-9	SULFURIC ACID	529,696	2.95 %
N230	GLYCOL ETHERS (EXCEPT SURFACTANTS)	467,967	2.61 %
67-56-1	METHANOL	439,491	2.45 %
1634-04-4	METHYL TERT-BUTYL ETHER	372,410	2.08 %
78-93-3	METHYL ETHYL KETONE	366,225	2.04 %
	Sum of Top Ten:	**14,319,072**	**79.82 %**
	Sum Other:	**3,619,543**	**20.18 %**
	Sum All:	**17,938,615**	**100.00 %**

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Table 32. Top 10 Carcinogens Released On-Site in 2001

CAS Number	Substance Name	On-Site Releases	% of Total
100-42-5	STYRENE	171,418	20.90 %
75-09-2	DICHLOROMETHANE	141,848	17.30 %
79-01-6	TRICHLOROETHYLENE	106,444	12.98 %
71-43-2	BENZENE	88,823	10.83 %
74-85-1	ETHYLENE	67,641	8.25 %
78-87-5	1,2-DICHLOROPROPANE	63,472	7.74 %
75-01-4	VINYL CHLORIDE	30,481	3.72 %
67-66-3	CHLOROFORM	25,940	3.16 %
7440-02-0 & N495	NICKEL & COMPOUNDS	24,914	3.04 %
7440-47-3 & N090	CHROMIUM & COMPOUNDS	18,063	2.20 %
	Sum of Top Ten:	**739,044**	**90.13 %**
	Sum Other:	**80,971**	**9.87 %**
	Sum All:	**820,015**	**100.00 %**

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http:/datamine.state.nj.us/wi for county summary reports from 1994-2001

http://www.state.nj.us/dep/opppc/for copies of Trends Report